

FIG. 3

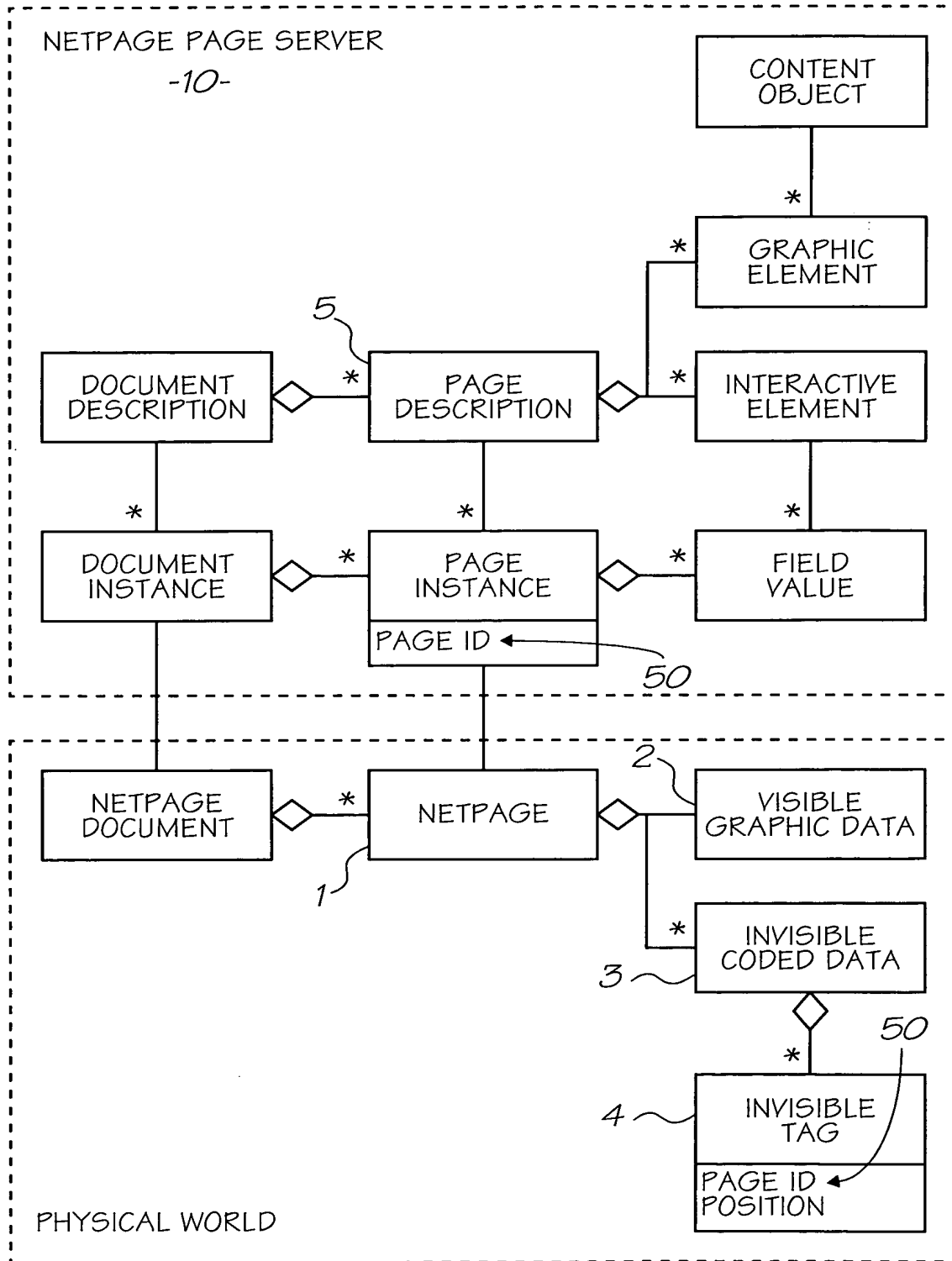


FIG. 4

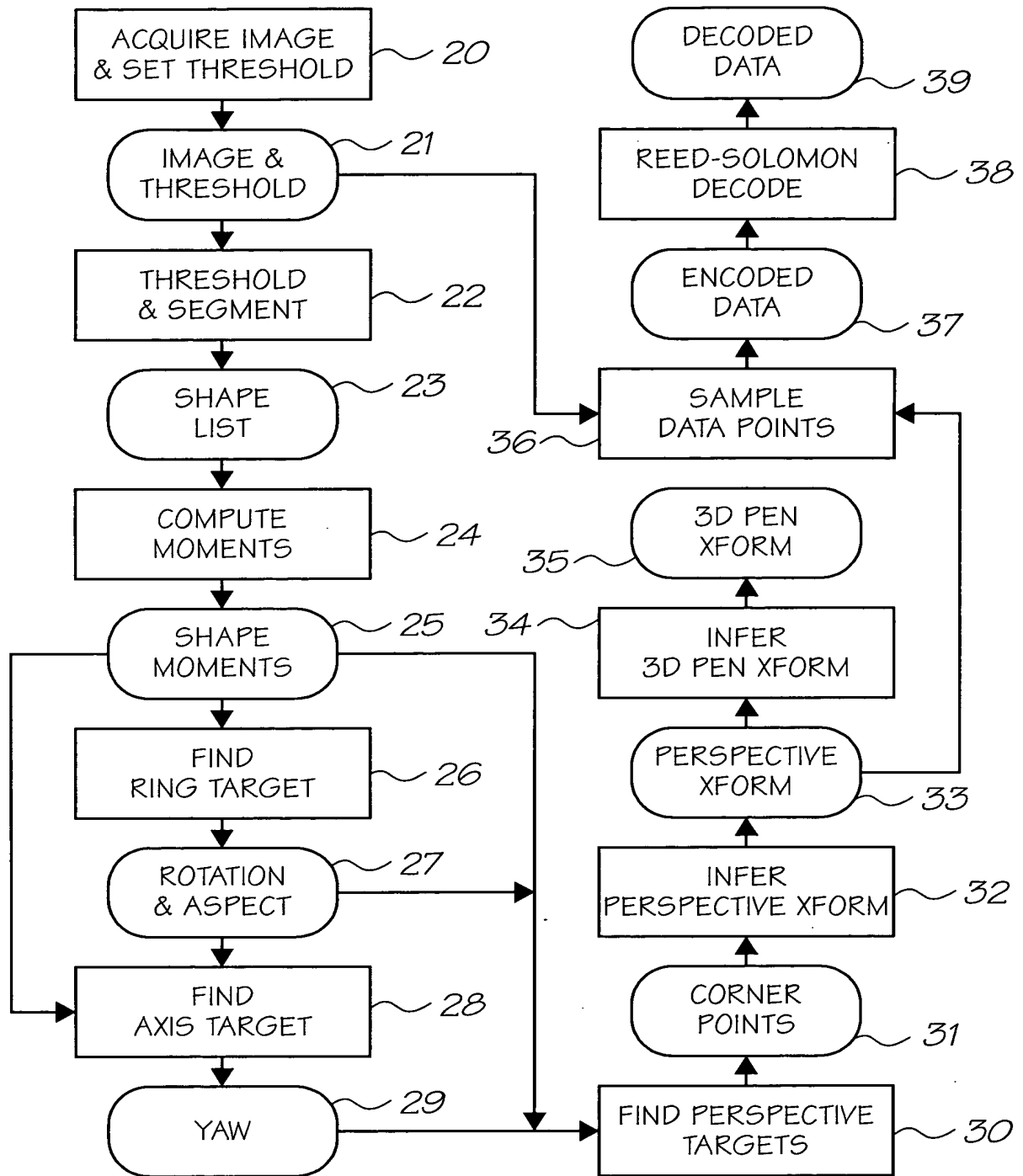


FIG. 7

7/73

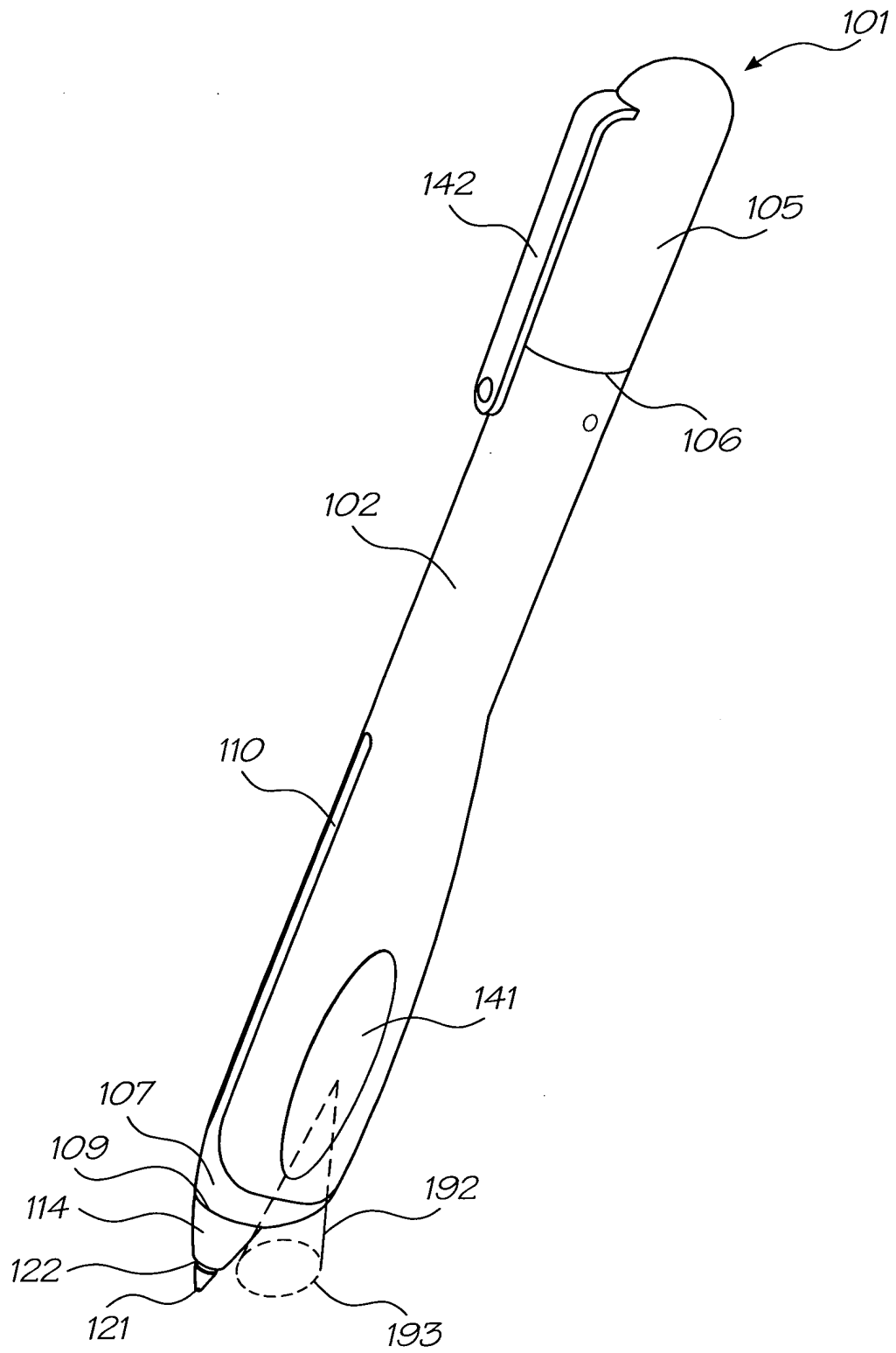


FIG. 8

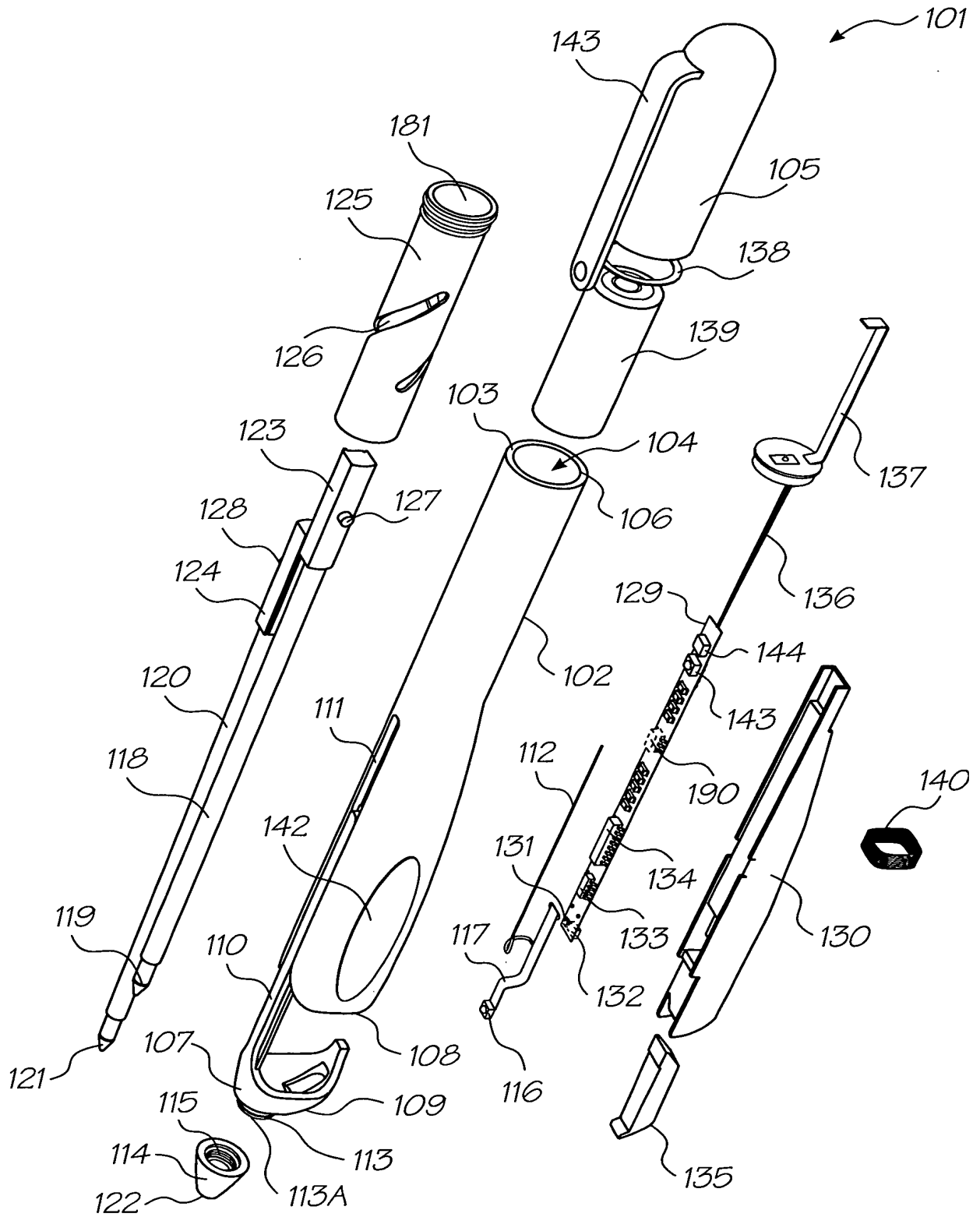


FIG. 9

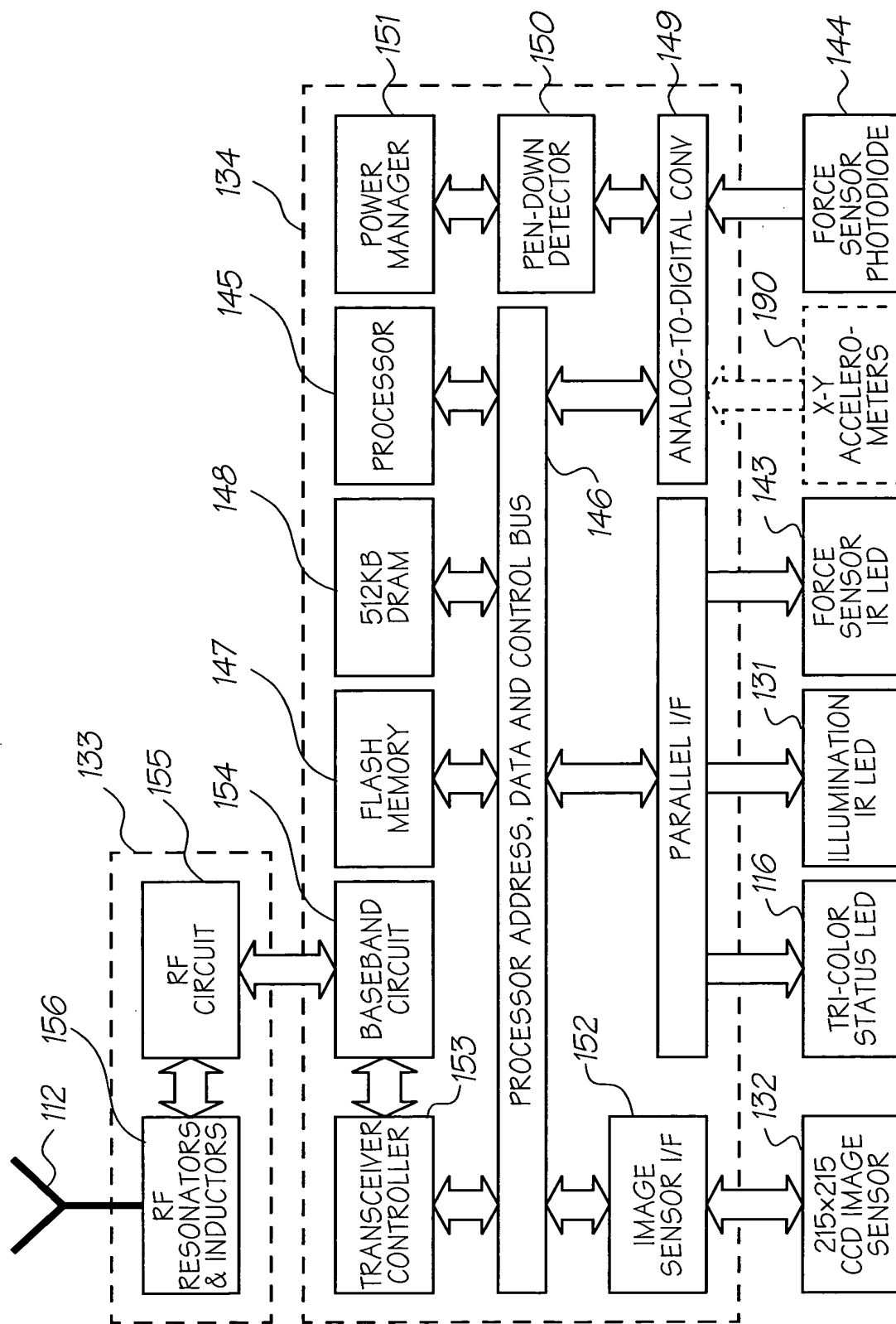


FIG. 10



FIG. 11

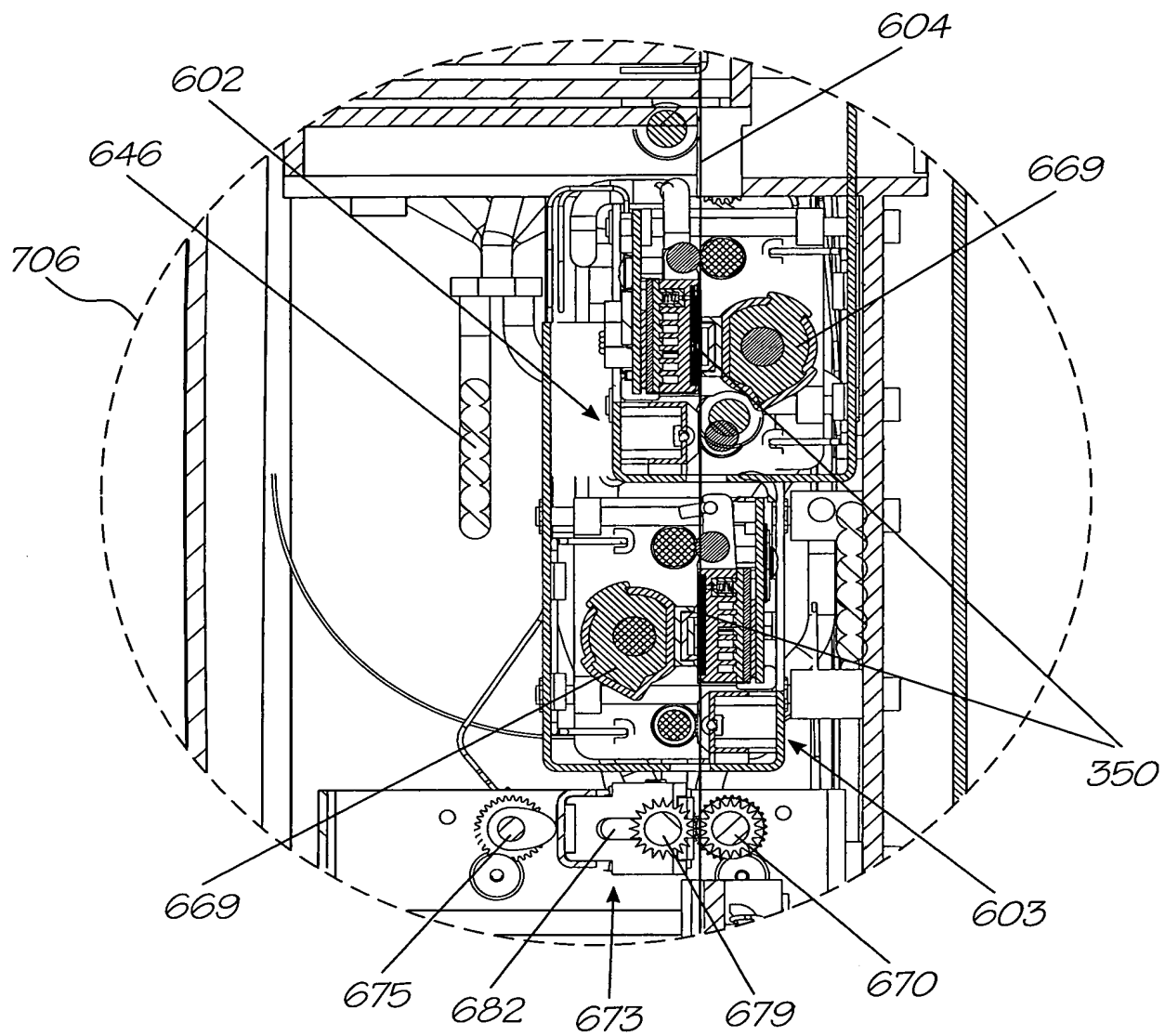


FIG. 12a

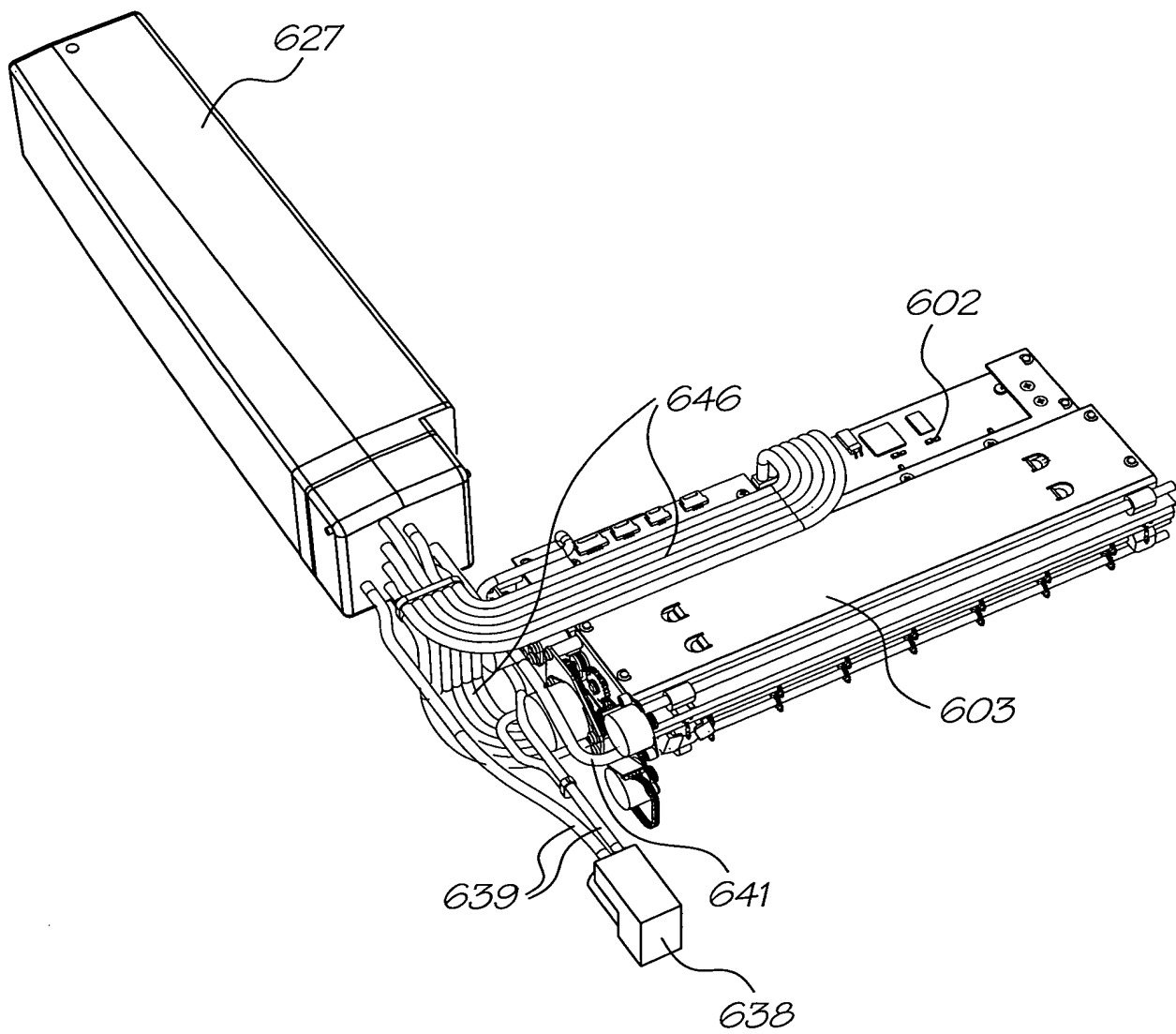


FIG. 13

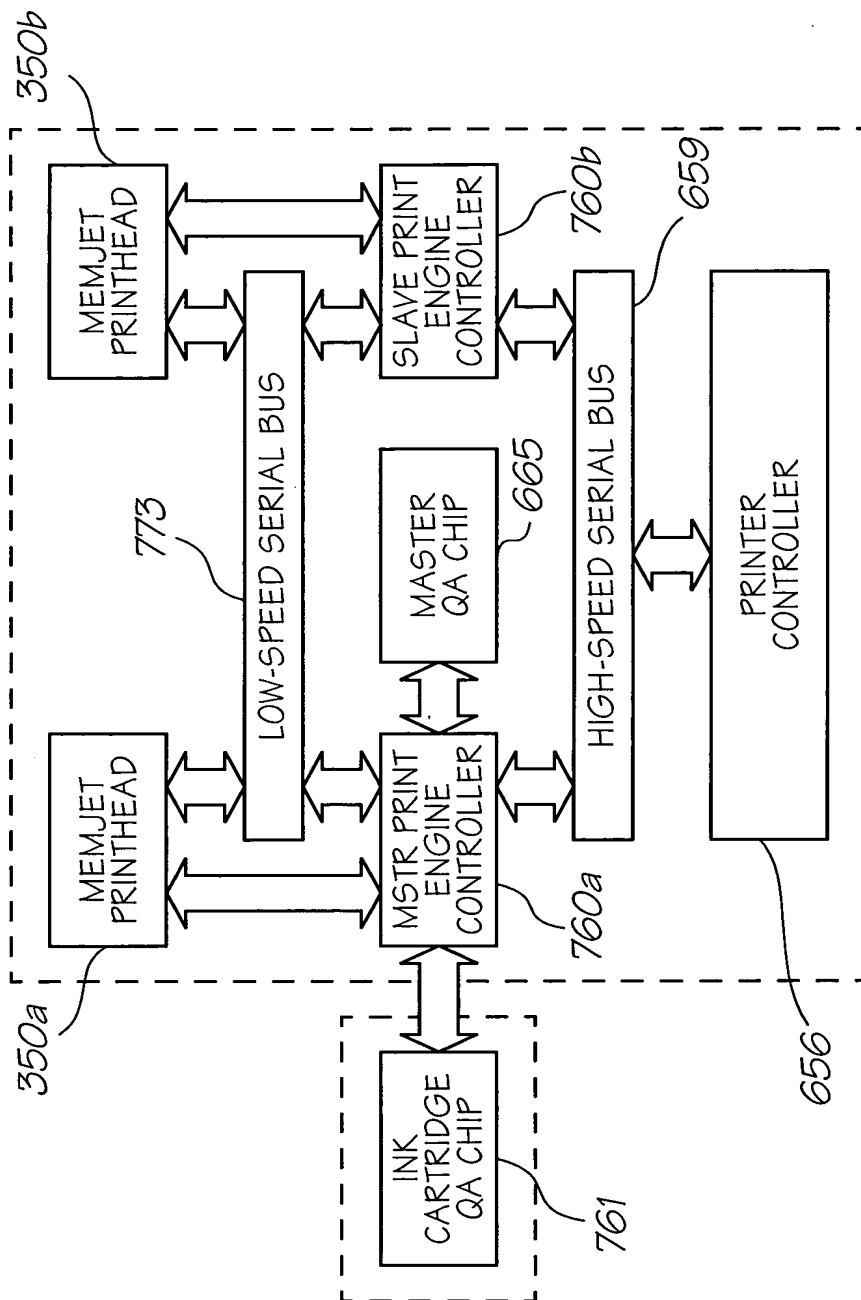


FIG. 15

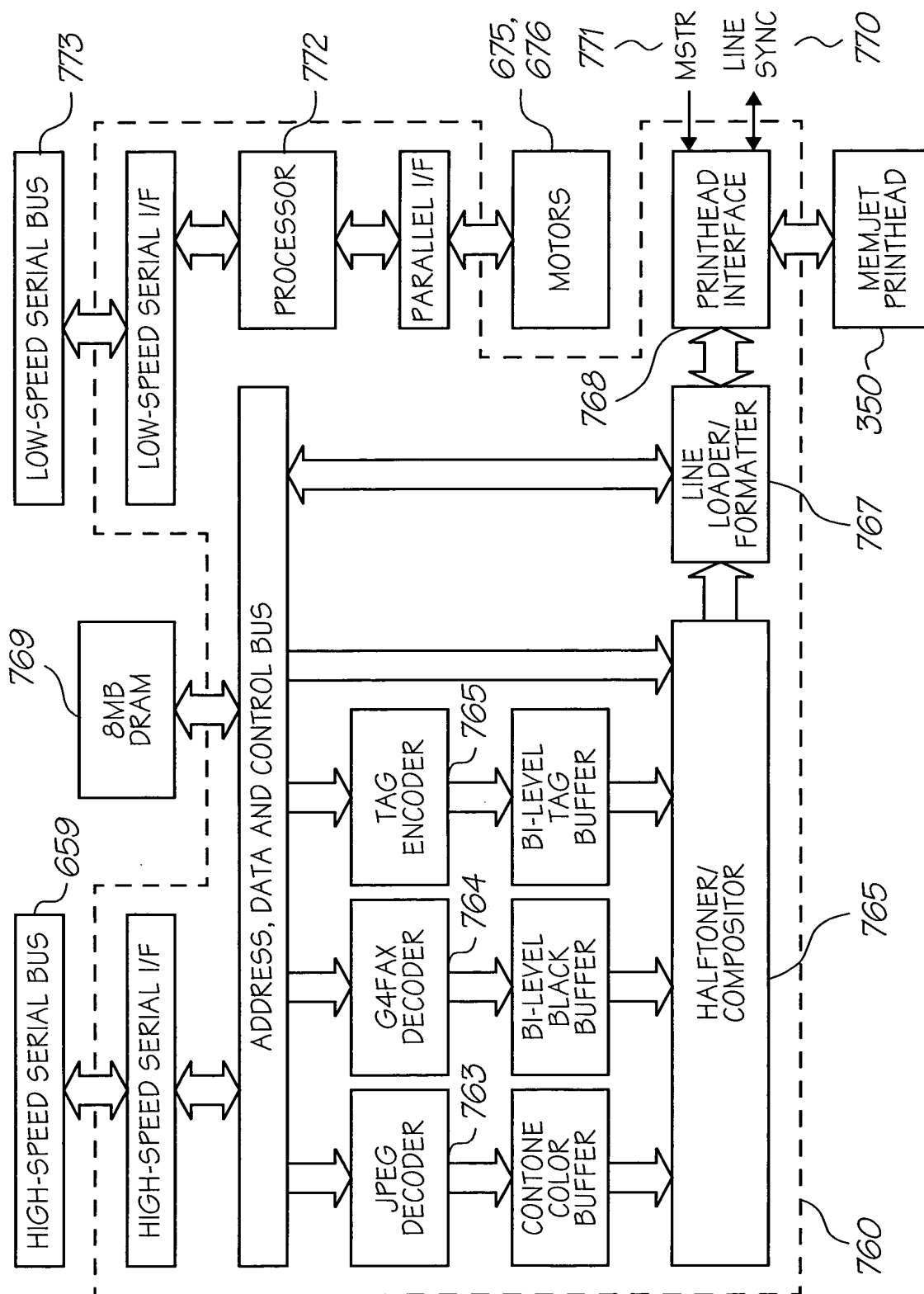


FIG. 16

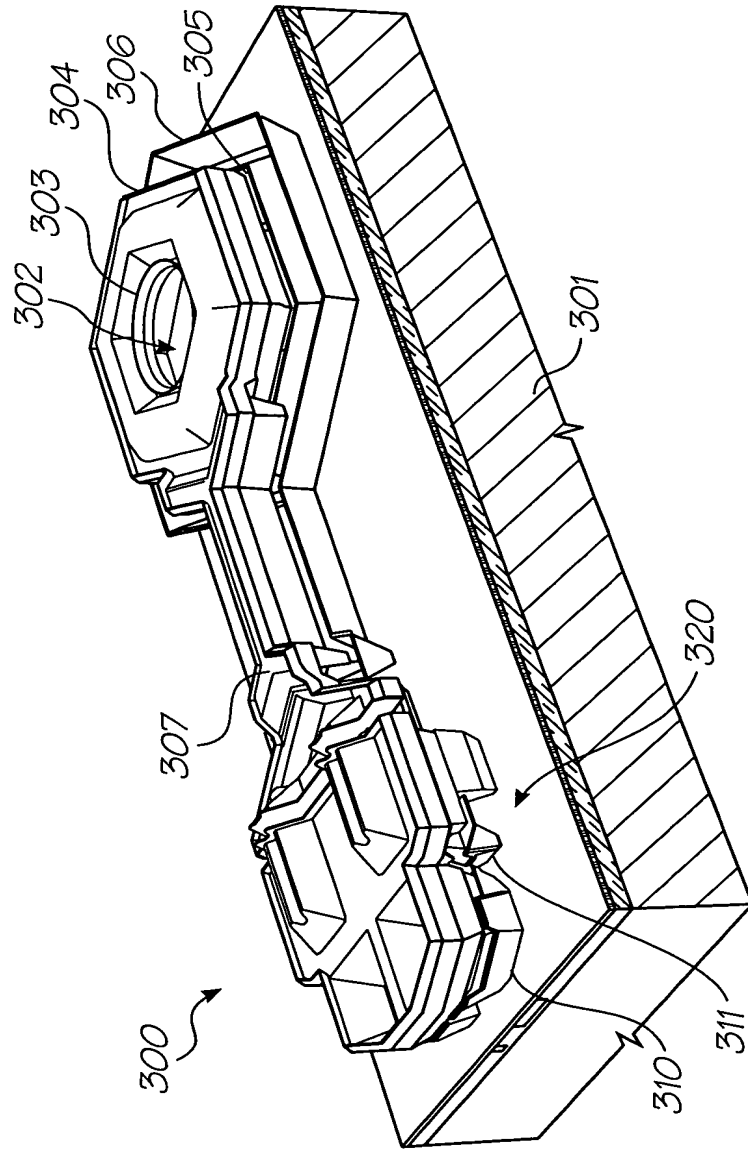


FIG. 17

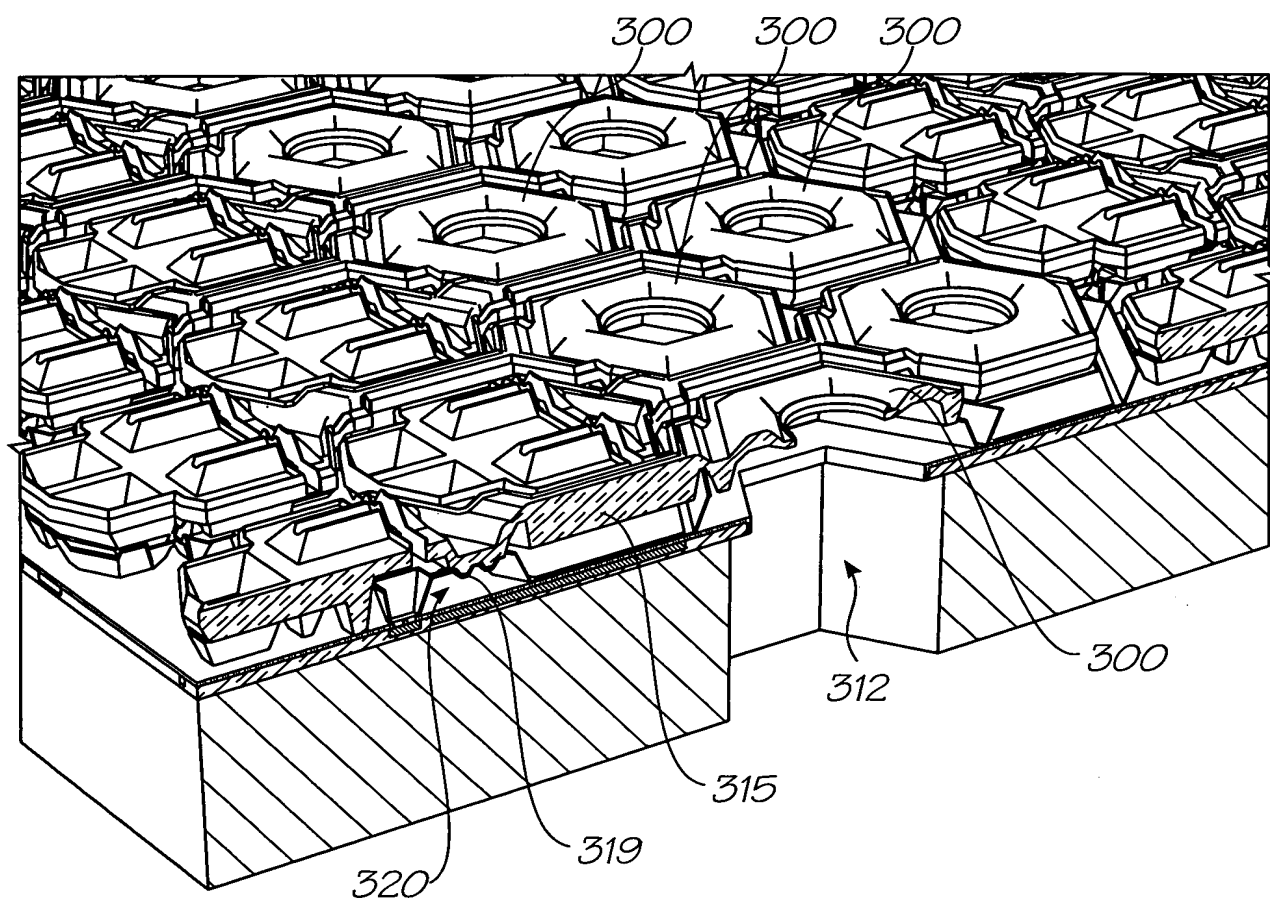
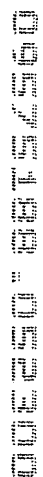


FIG. 18

[illegible]

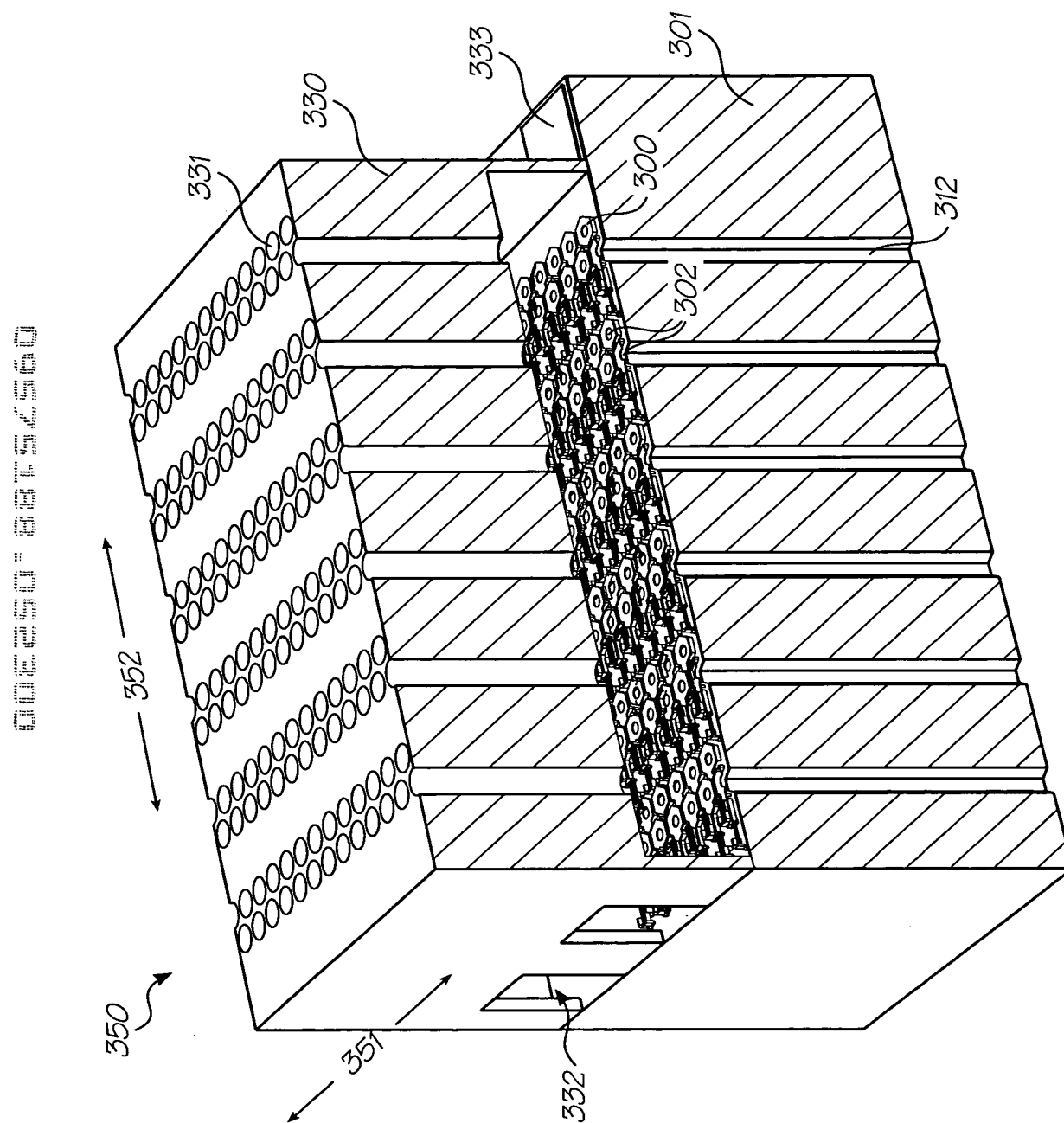


FIG. 20

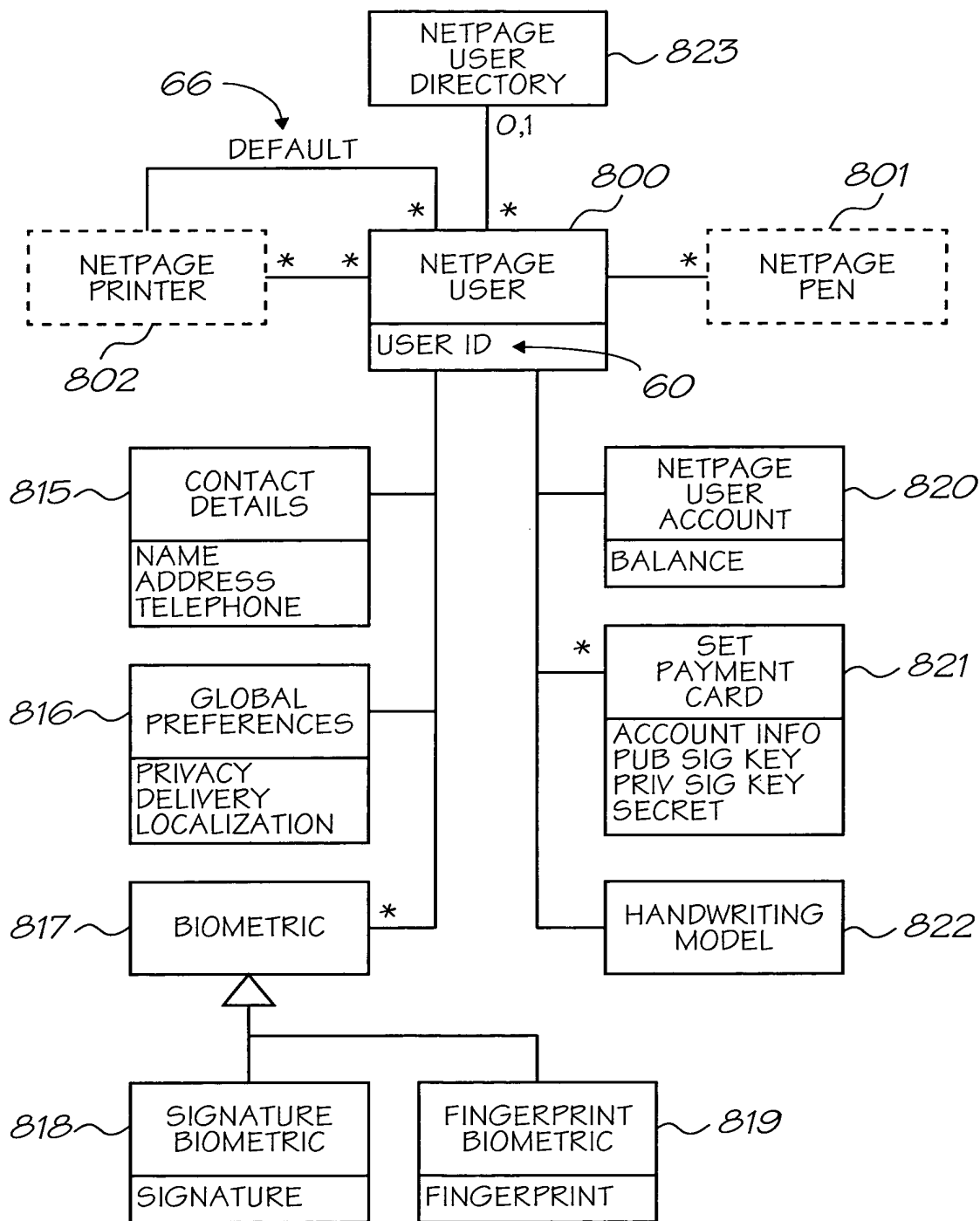


FIG. 21

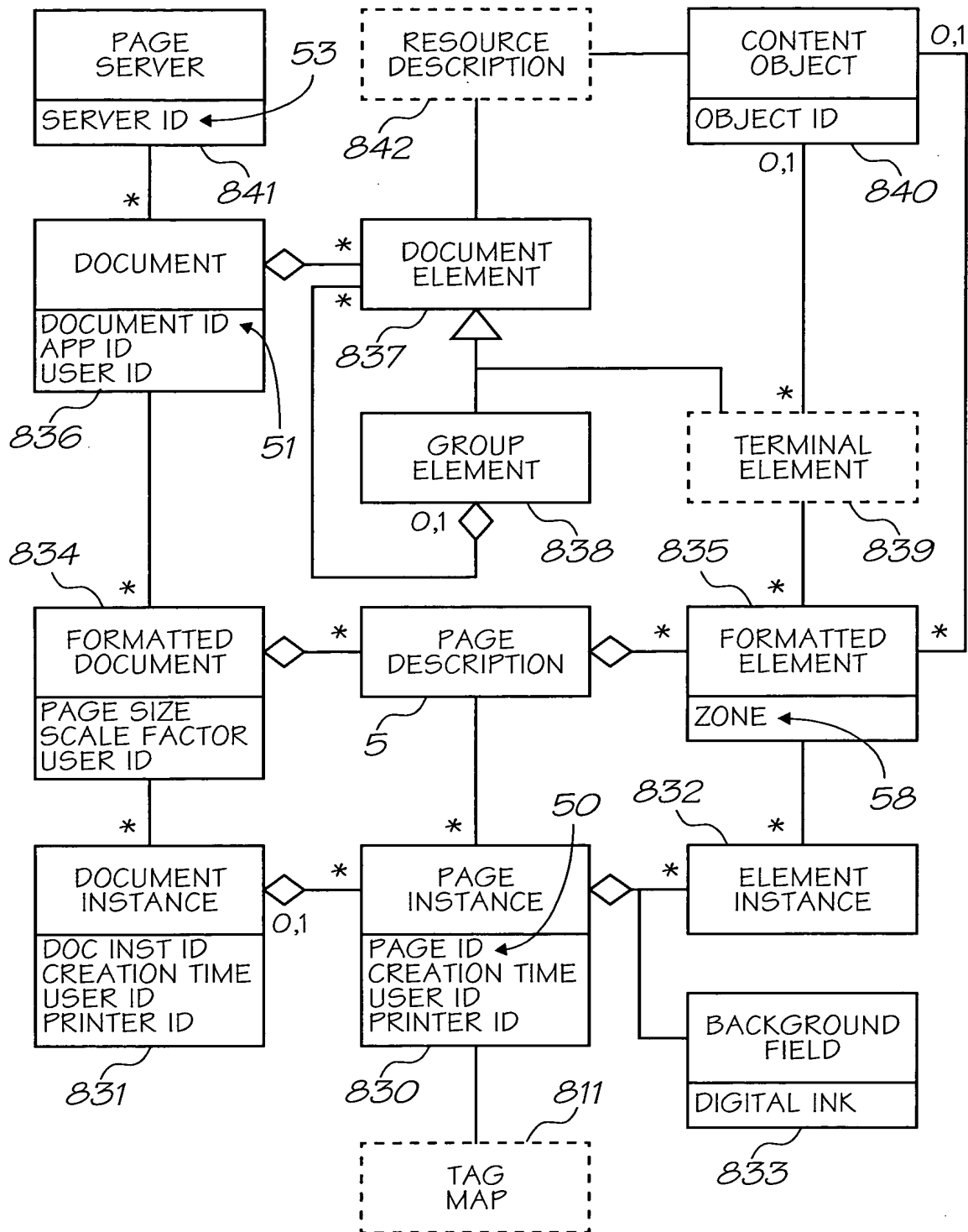


FIG. 25

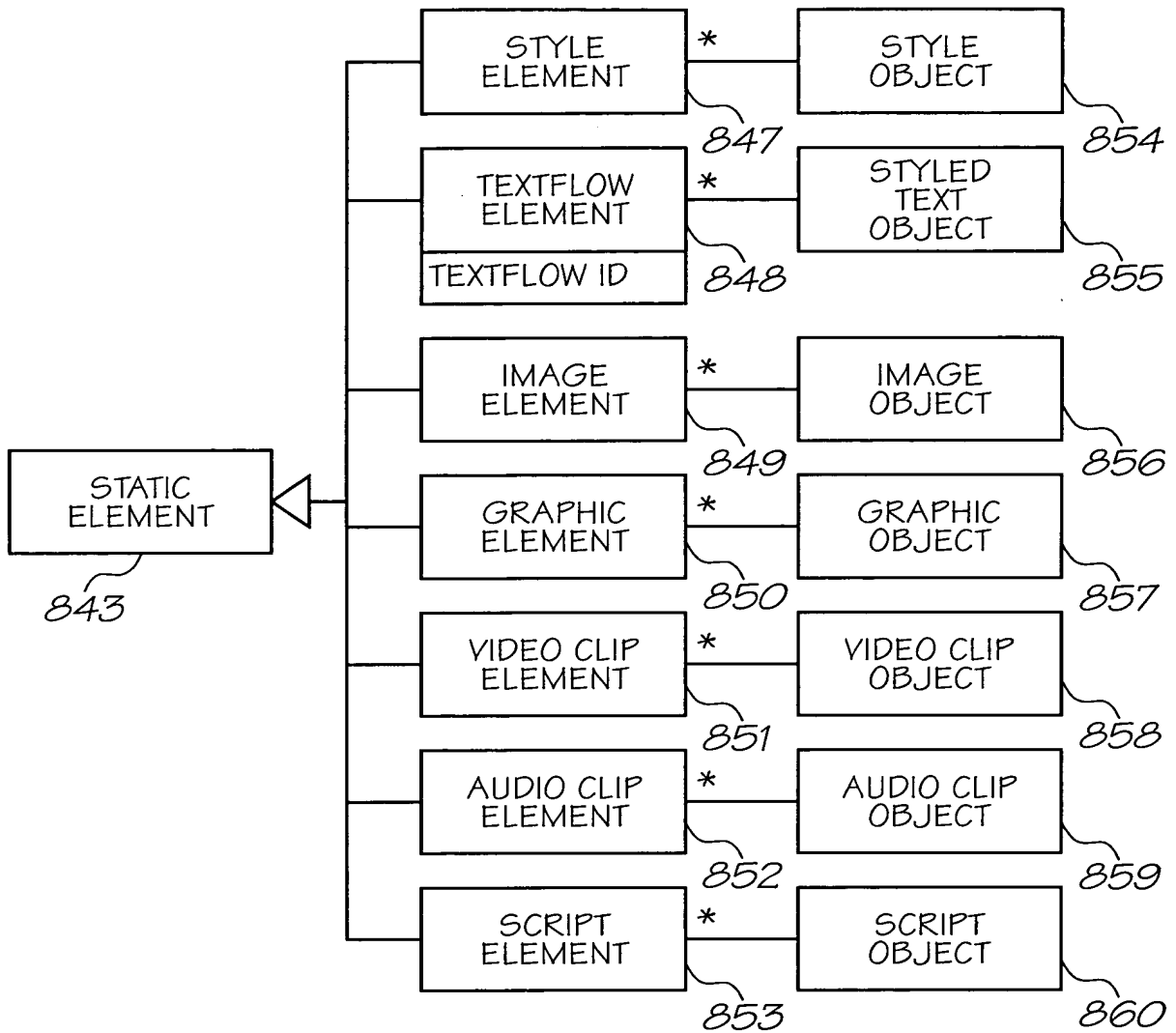


FIG. 28



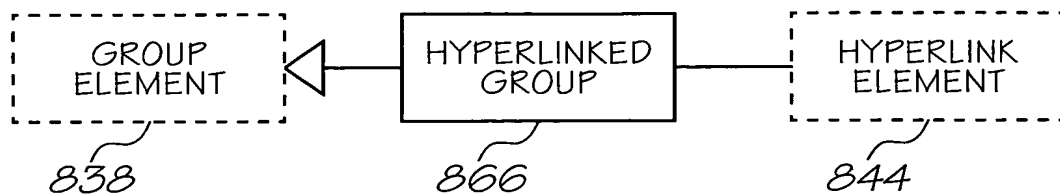


FIG. 31

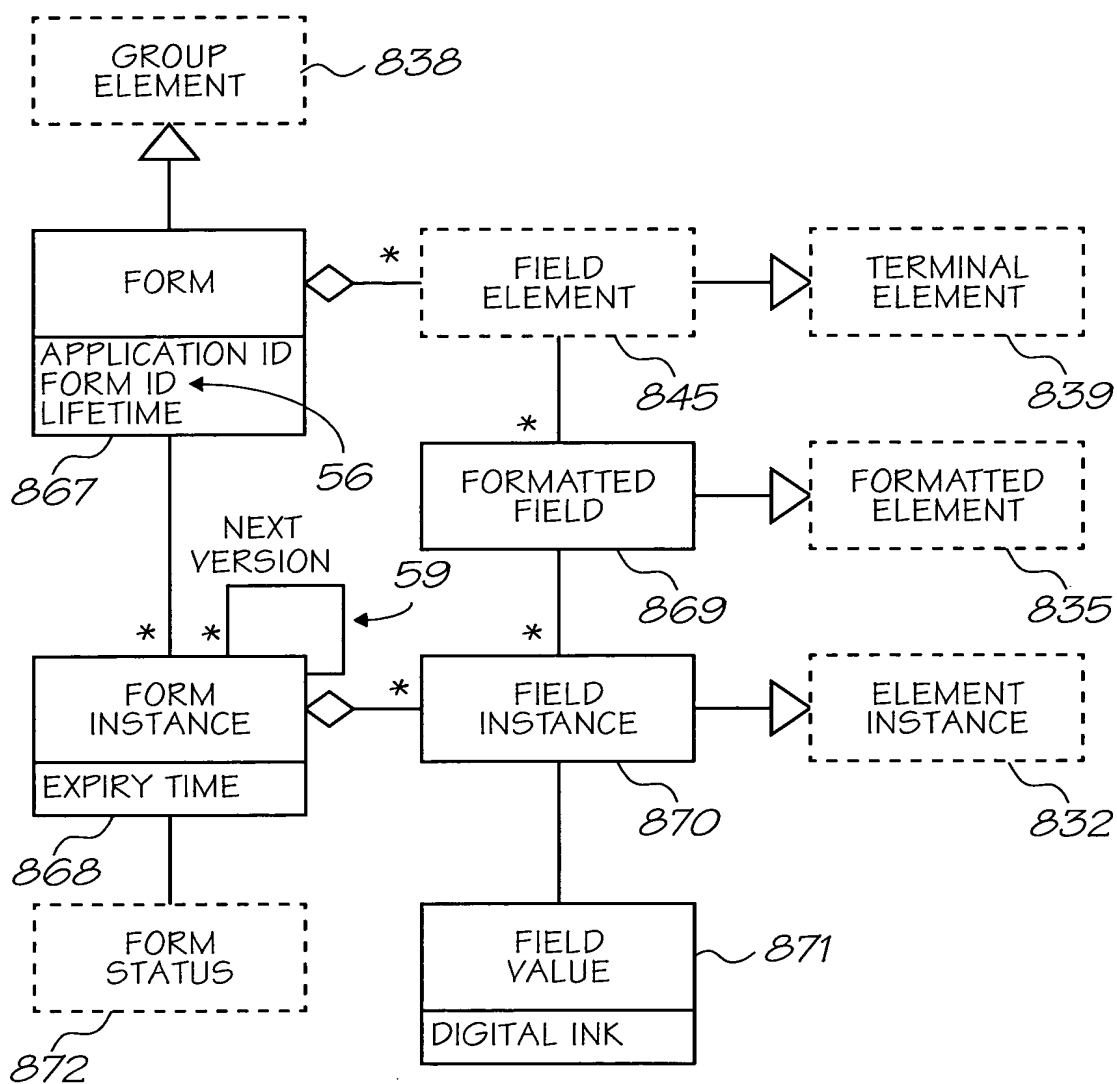


FIG. 32



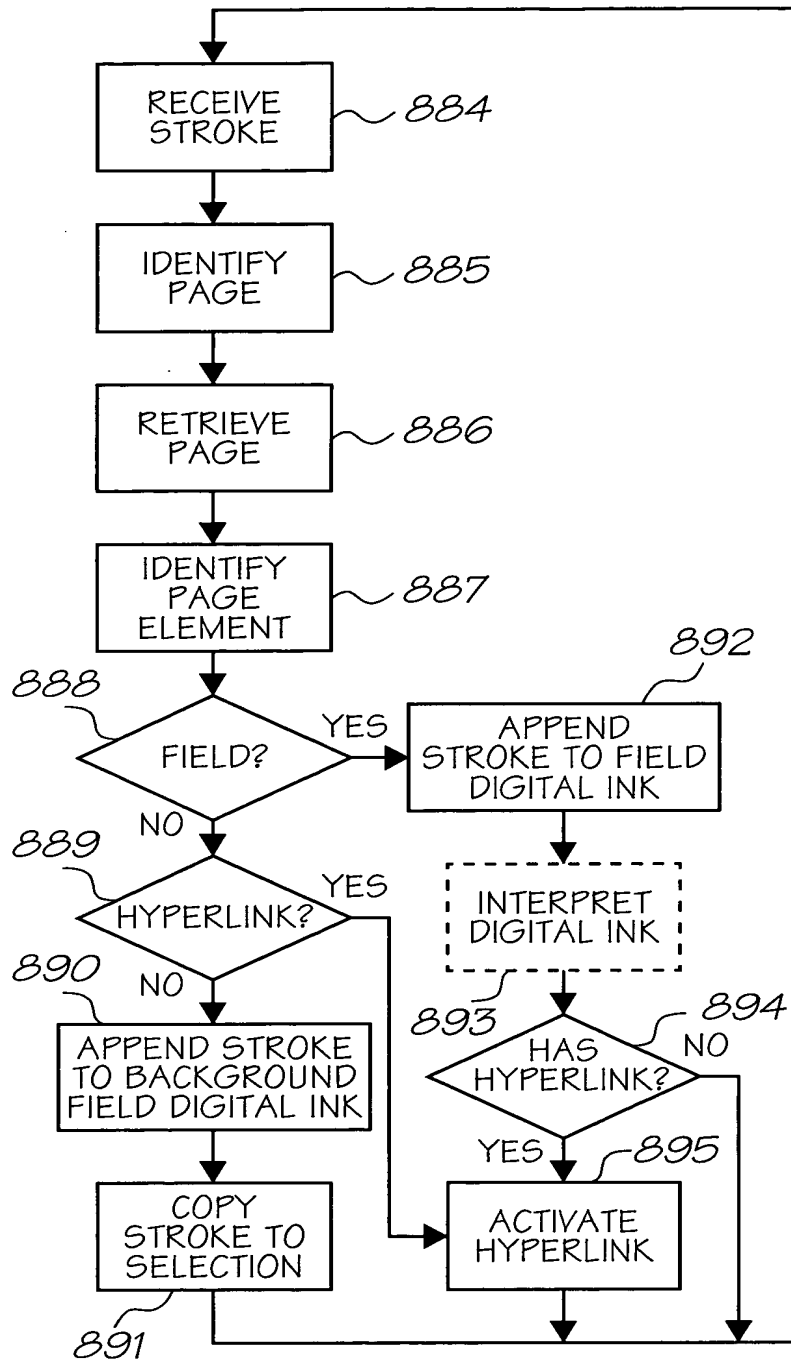


FIG. 38

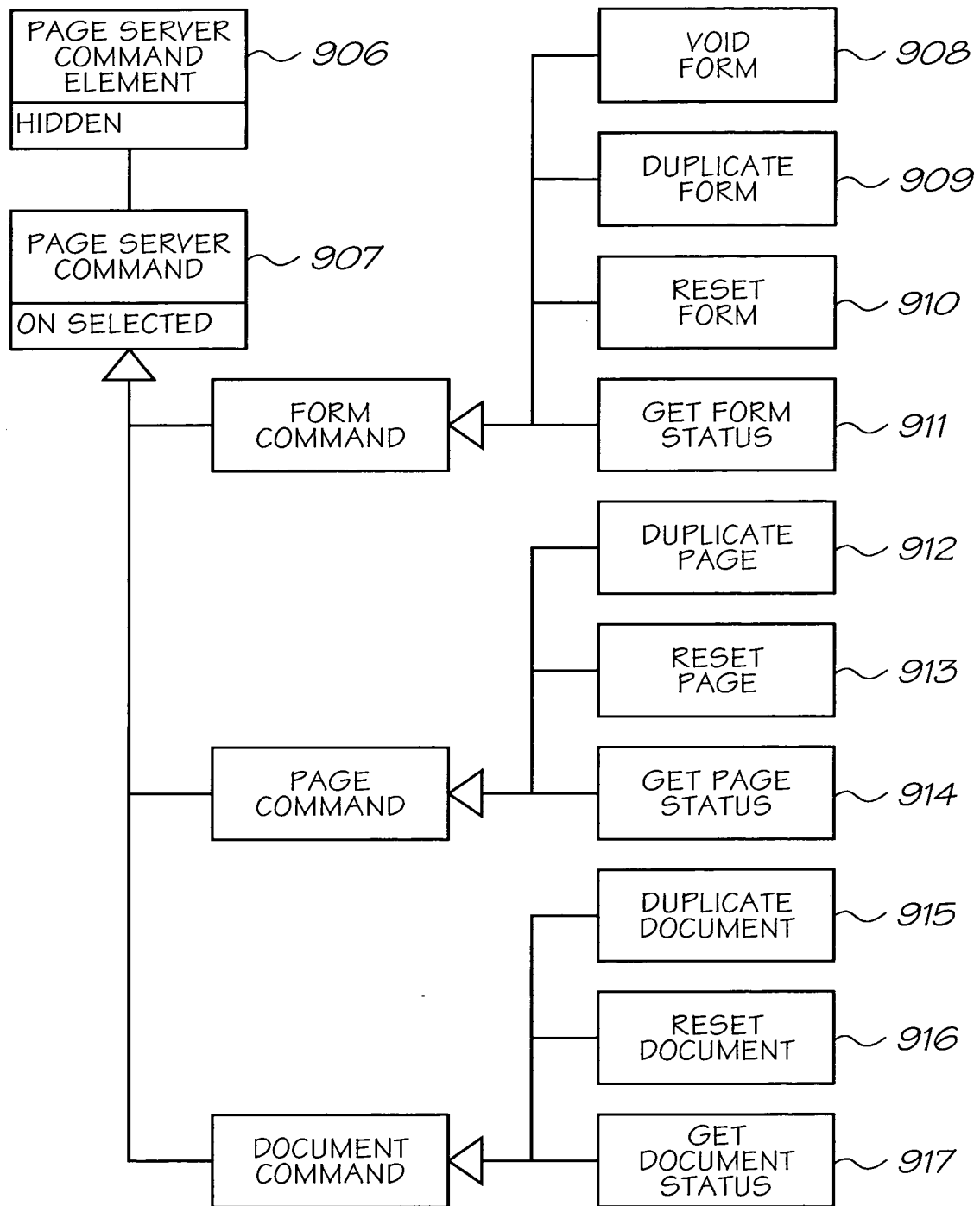


FIG. 39

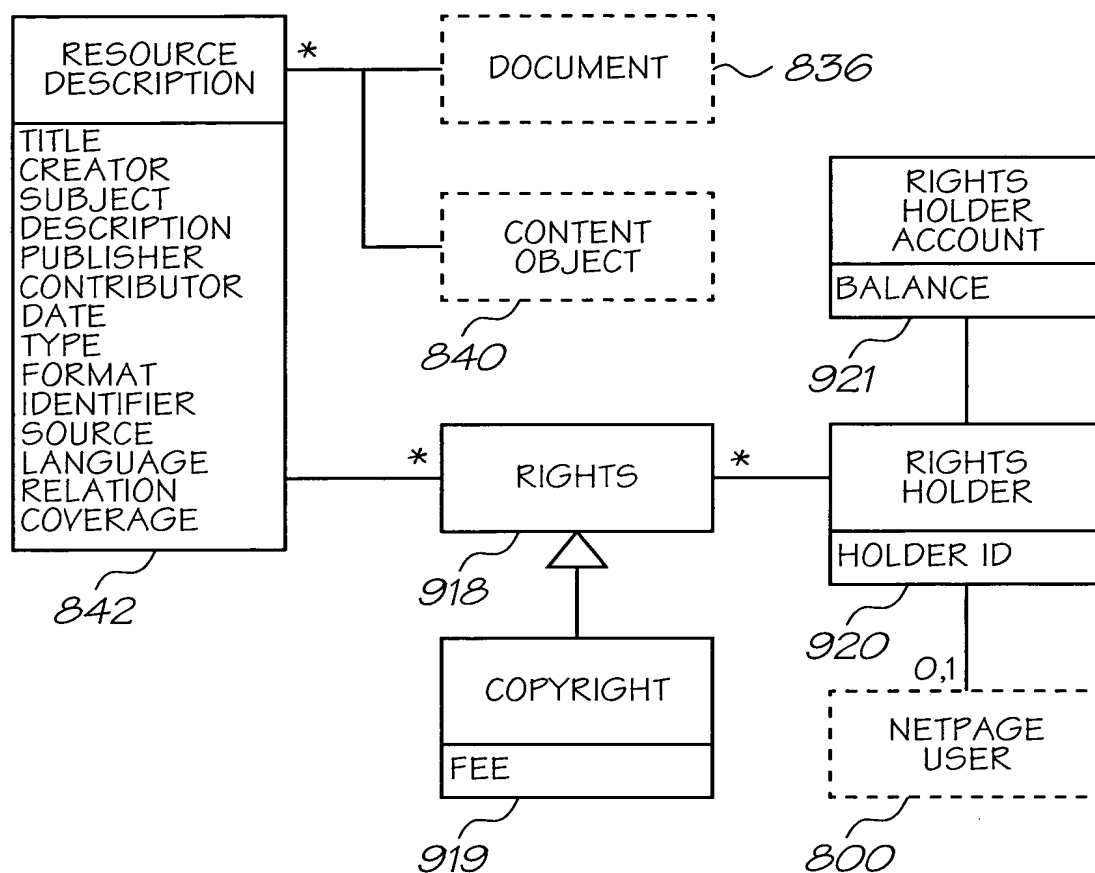


FIG. 40

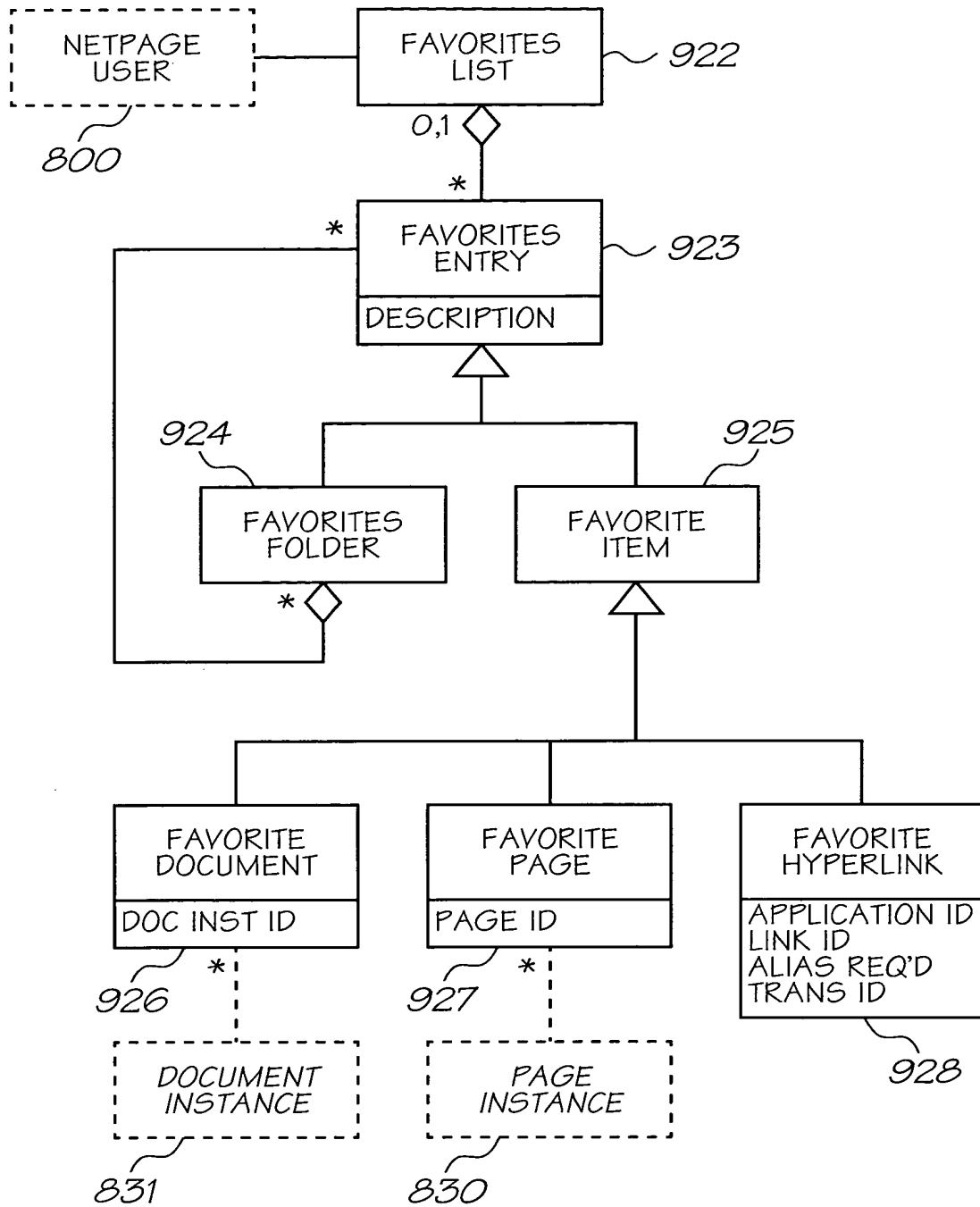


FIG. 41

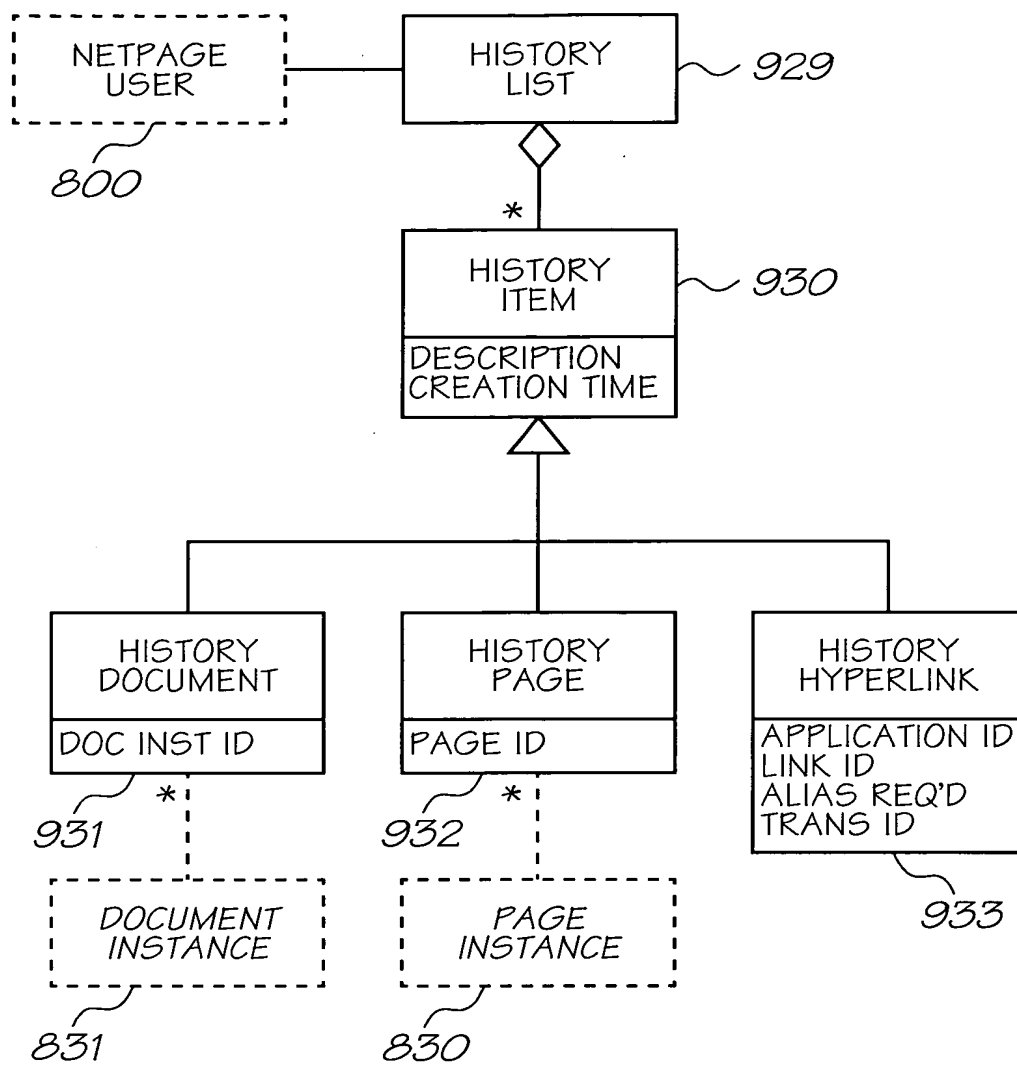


FIG. 42

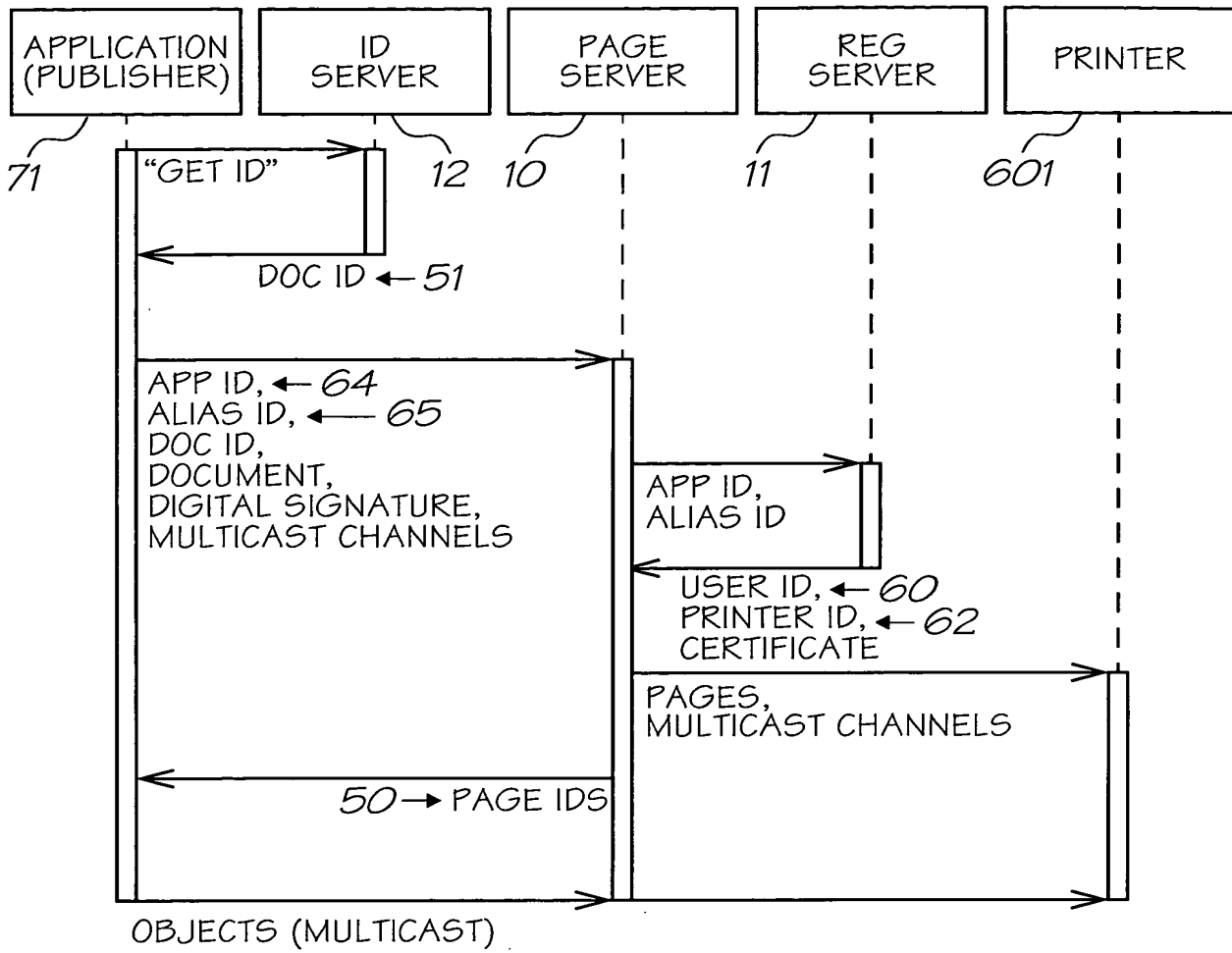


FIG. 43

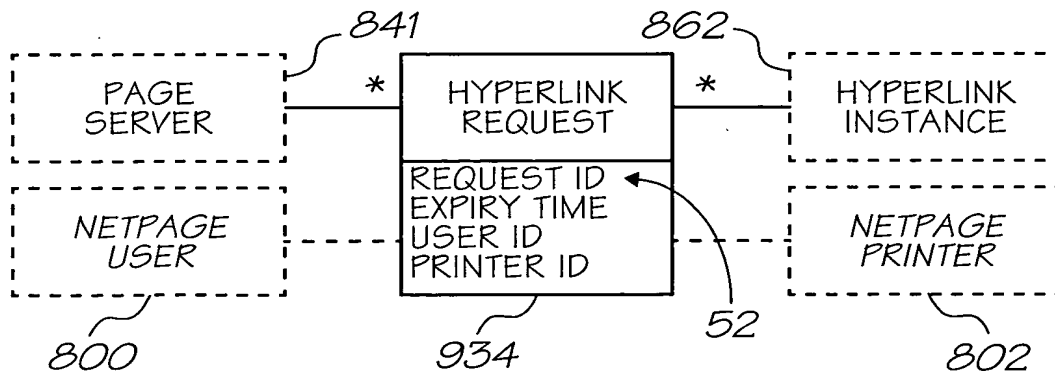
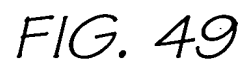


FIG. 44



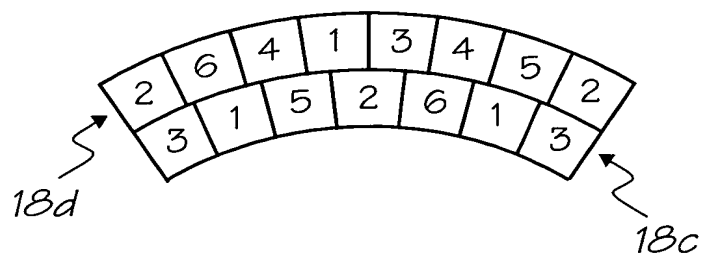


FIG. 50

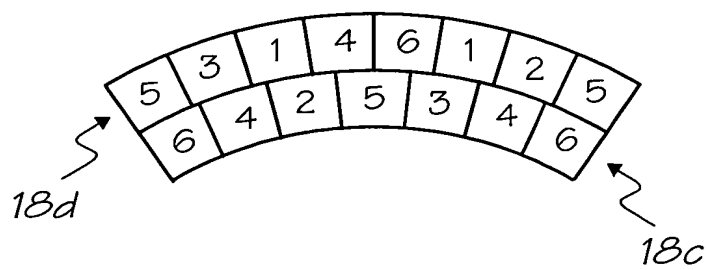


FIG. 51

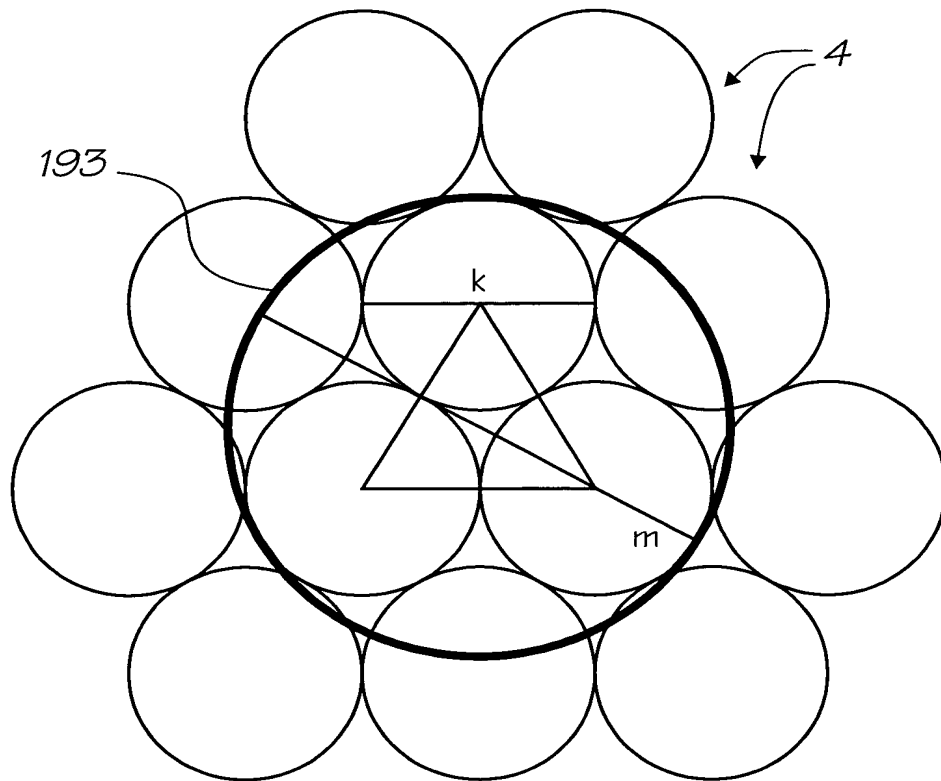
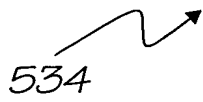


FIG. 52



FIG. 54



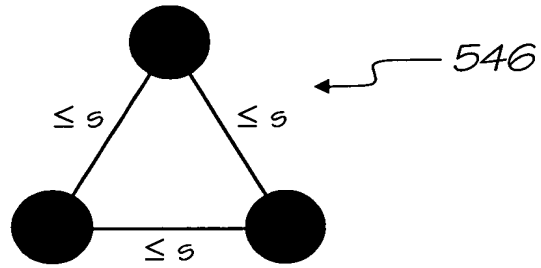


FIG. 57

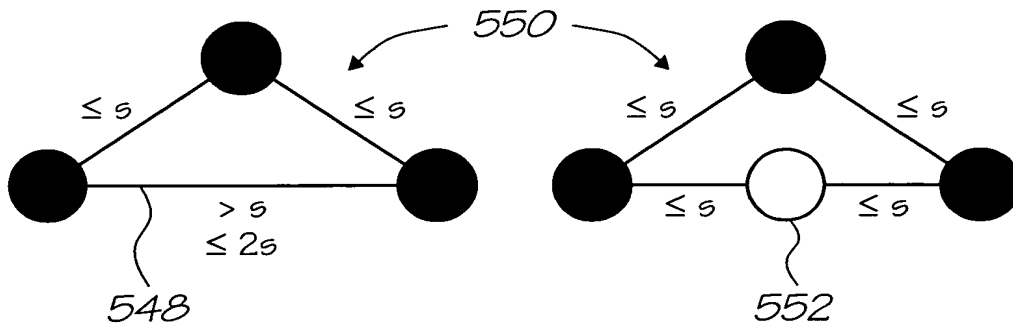


FIG. 58



FIG. 61

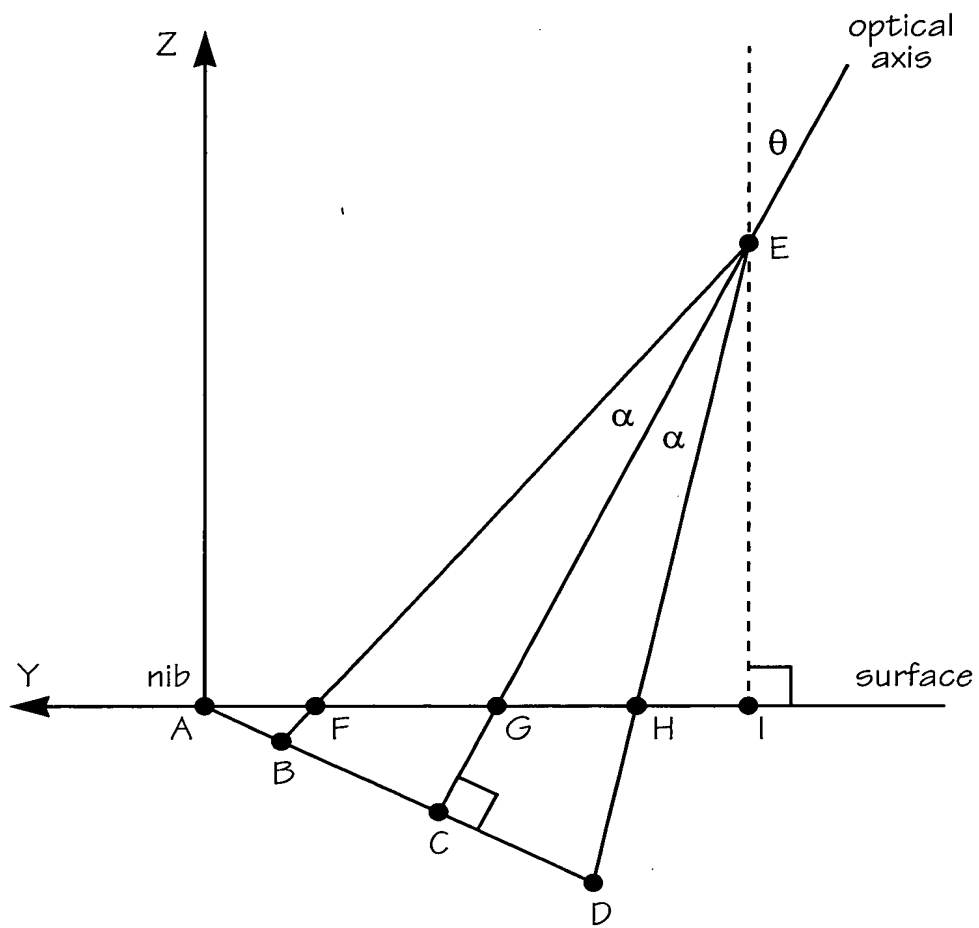


FIG. 62



FIG. 63

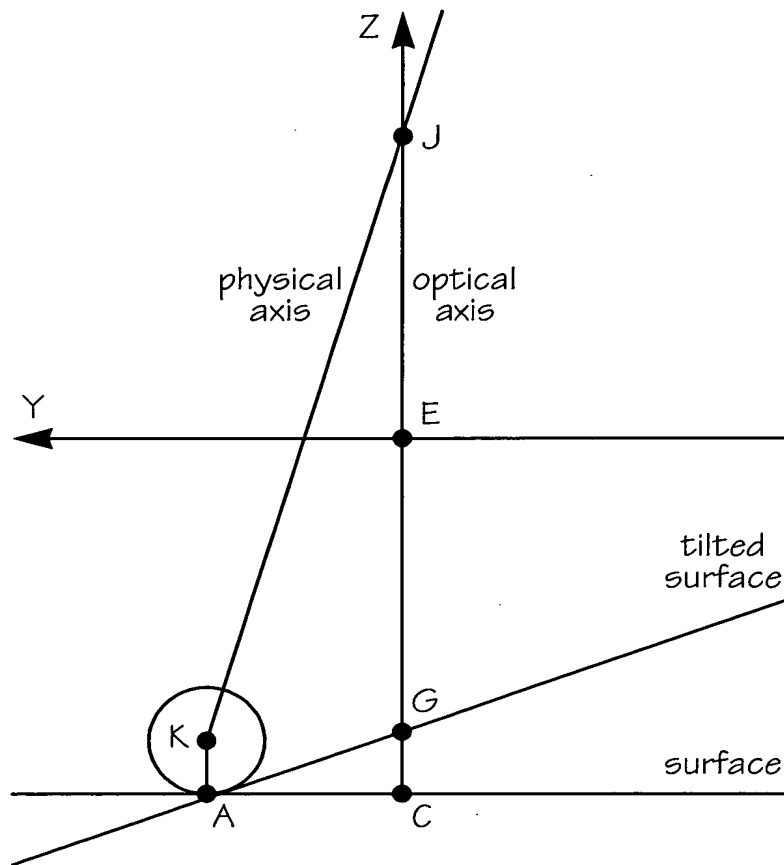


FIG. 64



FIG. 67

FIG. 69

FIG. 69

FIG. 70

EQ NUM	EQUATION
45	$R_x = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & E & -F & 0 \\ 0 & F & E & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
46	$M_3 = R_x M_2 = \begin{bmatrix} C & -D & 0 & AC - BD \\ DE & CE & -F & ADE + BCE \\ DF & CF & E & ADF + BCF \\ 0 & 0 & 0 & 1 \end{bmatrix}$
47	$R_y = \begin{bmatrix} G & 0 & H & 0 \\ 0 & 1 & 0 & 0 \\ -H & 0 & G & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

FIG. 73

EQ NUM	EQUATION
48	$M_4 = R_y M_3 = \begin{bmatrix} CG + DFH & CFH - DG & EH & GK + HL \\ DE & CE & -F & ADE + BCE \\ DFG - CH & DH + CFG & EG & GL - HK \\ 0 & 0 & 0 & 1 \end{bmatrix}$
49	$K = AC - BD$
50	$L = ADF + BCF$
51	$T_z = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & I \\ 0 & 0 & 0 & 1 \end{bmatrix}$

FIG. 74

EQ NUM	EQUATION
52	$M_5 = T_z M_4 = \begin{bmatrix} CG + DFH & CFH - DG & EH & GK + HL \\ DE & CE & -F & ADE + BCE \\ DFG - CH & DH + CFG & EG & GL - HK + I \\ 0 & 0 & 0 & 1 \end{bmatrix}$
53	$M_p = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & J & 1 \end{bmatrix}$
54	$M_6 = M_p M_5 = \begin{bmatrix} CG + DFH & CFH - DG & EH & GK + HL \\ DE & CE & -F & ADE + BCE \\ 0 & 0 & 0 & 0 \\ J(DFG - CH) & J(DH + CFG) & EGJ & J(GL - HK + I) + 1 \end{bmatrix}$

FIG. 75

FIG. 78

FIG. 80

FIG. 81

EQ NUMBER	EQUATION
121	$i(1 - Ag - Bh) = IJ + 1$
122	$\text{sign}(i) = -\text{sign}(1 - Ag - Bh)$
123	$\gamma = \arctan(D, C)$
124	$S = \frac{di}{DE}$
125	$S = \frac{ei}{CE}$
126	$\text{sign}(FH) = \text{sign}\left(\frac{ad + be}{ae - bd}\right)$
127	$J = \left \frac{gi}{-CH + \text{sign}(FH)DFG} \right $
128	$J = \left \frac{hi}{DH + \text{sign}(FH)CFG} \right $
129	$I = \frac{(i - Agi - Bhi - 1)}{J}$

FIG. 84

case	C,D	E,F	G,H	ai	bi	ci	di	ei	fi	gi	hi
1a	$\pm 1,0$	1,0	1,0	$\pm S$	0	$\pm AS$	0	$\pm S$	$\pm BS$	0	0
1b	0, ± 1	1,0	1,0	0	$\pm(-S)$	$\pm(-BS)$	$\pm S$	0	$\pm AS$	0	0
1c	C,D	1,0	1,0	CS	-DS	Aai+Bbi	DS	CS	BS	0	0
2a	$\pm 1,0$	E,F	1,0	$\pm S$	0	$\pm AS$	0	$\pm ES$	Bei	0	$\pm FJ$
2b	0, ± 1	E,F	1,0	0	$\pm(-S)$	$\pm(-BS)$	$\pm ES$	0	Adi	$\pm FJ$	0
2c	C,D	E,F	1,0	CS	-DS	Aai+Bbi	DES	CES	Adi+Bei	DFJ	CFJ
3a	$\pm 1,0$	1,0	G,H	$\pm GS$	0	Aai	0	$\pm S$	$\pm BS$	$\pm(-HJ)$	0
3b	0, ± 1	1,0	G,H	0	$\pm(-GS)$	Bbi	$\pm S$	0	$\pm AS$	0	$\pm HJ$
3c	C,D	1,0	G,H	CGS	-DGS	Aai+Bbi	DS	CS	Adi+Bei	-CHJ	DHJ
4a	$\pm 1,0$	E,F	G,H	$\pm GS$	$\pm FHS$	Aai+Bbi	0	$\pm ES$	Bei	$\pm(-HJ)$	$\pm FGJ$
4b	0, ± 1	E,F	G,H	$\pm FHS$	$\pm(-GS)$	Aai+Bbi	$\pm ES$	0	Adi	$\pm FGJ$	$\pm HJ$
4c	C,D	E,F	G,H	CGS+ DFHS	-DGS+ CFHS	Aai+Bbi	DES	CES	Adi+Bei	-CHJ+ DFGJ	DHJ+ CFGJ

FIG. 85

description	case	condition	handling
zero pitch	3a	$b = d = h = 0$	$G \leftarrow \frac{a}{e}$ $\frac{HJ}{S} = \frac{-g}{e}$
	3b	$a = e = g = 0$	$G \leftarrow \frac{-b}{d}$ $\frac{HJ}{S} = \frac{h}{d}$
	3c	$\frac{a}{b} = \frac{g}{h}$	handle via 3a or 3b
	3		$E \leftarrow 1$ $F \leftarrow 0$ $H = \text{sign}\left(\frac{HJ}{S}\right) \sqrt{1 - G^2}$
non-zero pitch & non-zero roll	4	$(g \neq 0) \wedge (h \neq 0)$	handle via general solution

FIG. 87